

REMARKS

Claims 1-36 are pending in this application.

Claims 12, 28, 30 and 32 are objected to.

Claims 1-11, 13-27, 29, 31 and 33-36 are rejected.

In the non-final office action dated June 30, 2008, claims 1-11, 13-27, 29, 31 and 36 are rejected under 35 USC 103(a). Base claims 1, and 21 are rejected as being unpatentable over Kramer US Patent No. 6,466,539 in view of Lu U.S. Patent No. 7,269,133 and Fee 5,485,576. Base claim 13 is rejected as being unpatentable over Kramer in view of Fee and Ohyama U.S. Patent No. 4,794,595. Base claim 31 is rejected as being unpatentable over Kramer in view of Ohyama and Fukunaga Publication No. 20060002314.

Claims 21-36 have been cancelled.

Claim 1 has been cancelled and replaced by claim 37. New claim 37 recites the subject matter of original claim 1. New claim 37 also recites the recovery command with greater clarity.

New claim 37 recites a method of clearing latch-up and other single event functional interrupts in a data processing system having a plurality of nodes operatively connected to a serial data bus. Latch up refers to a monostable condition of a circuit, in which current continues in a self-sustaining manner. In certain environments, the latch-up is radiation-induced. In the system of figure 1, for example, the physical layer controller, or the link layer controller, or both, can experience latch-up.

The recovery command disrupts the monostable condition and restores functionality. For example, the recovery command can cause a circuit experiencing latch-up to power down and then power back up. The recovery command can also clear up other single event functional interrupts (SEFI).

This condition – latch-up – is not addressed by the documents cited in the office action. The cited documents do not teach or suggest an approach for clearing latch-up in nodes connected to a serial data bus.

Kramer discloses a serial bus system having two data lines and a plurality of subscribers 14, 16, 18 and 20 connected to the bus system. The subscribers include a bus master 14 at one end of the line, a terminating module 16 at the other end of the line, and bus subscribers 18 and 20 in-between. The bus master 14 and terminating module 16 send messages to each other, and the bus subscribers 18-20 check the messages to see whether they are received within a fault tolerance time (col. 6, lines 34-48). If a bus subscriber detects a fault (a status message is in error or not received within a certain time period – see col. 7, lines 55-58) - it can bring the system into a fail-safe state (col. 6, lines 48-52). The safe state is a standstill of the technical system, device, or machine by cutting off power.

Kramer takes a different approach towards messaging. The master bus subscriber, which sends the message, does not wait for a return message. Rather, a downstream bus subscriber determines whether it receives a message within a specific time period.

The subscriber sending the message does not cause the power to be turned off. The subscriber examining the messages would perform that function.

Kramer does not disclose a “recovery command” that causes a monostable condition to be disrupted, and also causes functionality of the node to be restored. Kramer’s system simply enters a safe state by cutting off power.

Moreover, the effects of Kramer’s safe state are far more reaching than the recovery command of claim 37. Kramer discloses a power shut down, which can affect other nodes as well as the node experiencing latch-up.

The other cited documents do not teach or suggest the differences between claim 37 and Kramer. Lu discloses a system having an active MCP (master control processor) and a backup MCP. If the active MCP fails, the backup MCP enters a “recovery synchronization phase” and takes over operation as a standalone system. The recovery synchronization phase (col. 10, lines 15-23) includes a begin stage (col. 10, lines 24+), a recovery stage, and an end stage. These stages all involve running programs, synchronizing data, computing new peer routes, etc. Lu does not disclose a recovery stage that causes another node to clear a monostable condition. To the contrary, Lu suggests using a different node.

The office action alleges that a synchronization flag is equivalent to a latch-up error, and that clearing the flag is equivalent to clearing up the error. However, neither the application nor the cited documents support that allegation. Regardless, the point is moot because new claim 37 expressly recites disrupting a monostable condition.

The use of physical and link layer controllers is now recited in new claims 38-39, which depend from claim 37. The office action contends that such controllers are shown in Fee and are obvious because they would “provide network security” in Kramer’s system. However, the physical and link layers do not provide network security. In the OSI model for network communication, network security is provided at a higher layer (6), not layers 1 or 2.

Thus, the office action has not established prima facie obviousness of claim 37. Accordingly, claim 37 should be allowed over the cited documents.

Claims 2-6 have been cancelled, and claims 7-11 have been amended to depend from new claim 37. Claim 12 has been cancelled and replaced by new claim 40, which also depends from claim 37. Dependent claims 7-11 and 38-40 should be allowed for the reasons above.

Claim 13 has been cancelled and replaced by new claim 41. Claim 41 recites the subject matter of original claim 13. New claim 41 also recites the nodes with greater clarity.

Ohyama is cited in the rejection of claim 13. Ohyama discloses a telephone system that continues communication even when power supply to a data circuit equipment terminal (DCE) has stopped (col. 2, lines 31-34). The DCE sends digitalized voice from a telephone to a line after it is combined with data sent from a data terminal, and separates the digital signal sent from the line into voice and data (col. 1, lines 17-21).

The office action cites Figures 4, element 7 (incorrectly identified as a DCE) and alleges that Ohyama discloses a link layer and a physical layer. However, Ohyama does not support the allegation. Element 7 of Figure 4 is office channel equipment (OCE), whose function is to separate the data from the voice on the office side and send these signals to the exchanger or data gathering equipment, and send voice and data to the line and supply supervisory current to the DCE (col. 1, lines 22-28). In contrast, physical and link layer controllers are data bus controllers that, for example, perform functions defined by the OSI network model. Ohyama is silent about these functions. Ohyama is also silent about latch-up.

New claim 41 should be allowed because the cited documents do not establish prima facie obviousness. New claims 42-46 and 15-20 should also be allowed, since they depend from new claim 41 (claim 20 has been amended to restore the subject matter of original claim 20). Claim 14 has been cancelled.

The attached document provides secondary evidence of non-obviousness. The attached document, entitled "Radiation-Tolerant Dual Data Bus," describes work done by the applicant. The attached document was published by NASA (at <http://www.techbriefs.com/content/view/2079/34/1/0/>). The system disclosed in the attached document has been highlighted by NASA.

The office action also raises an objection to the claims for reciting “busses” instead of “buses.” The objection is respectfully traversed because the claims are consistent with the specification.

If the Examiner has any questions or wishes to further discuss this application, he is encouraged to contact the undersigned before issuing another office action.

Respectfully submitted,

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